
Assessing the therapeutic potential of lab-made hepatocytes.

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Public Summary:

This review defines the therapeutic potential of current hepatocytes made in the laboratory from other, readily and safely accessible human cell types.

Scientific Abstract:

Hepatocyte transplantation has potential as a bridge or even alternative to whole-organ liver transplantation. Because donor livers are scarce, realizing this potential requires the development of alternative cell sources. To be therapeutically effective, surrogate hepatocytes must replicate the complex function and ability to proliferate of primary human hepatocytes. Ideally, they are also autologous to eliminate the need for immune suppression, which can have severe side effects and may not be sufficient to prevent rejection long term. In the past decade, several methods have been developed to generate hepatocytes from other readily and safely accessible somatic cells. These lab-made hepatocytes show promise in animal models of liver diseases, supporting the feasibility of autologous liver cell therapies. Here, we review recent preclinical studies exemplifying different types of lab-made hepatocytes that can potentially be used in autologous liver cell therapies. To define the therapeutic efficacy of current lab-made hepatocytes, we compare them to primary human hepatocytes, focusing on engraftment efficiency and posttransplant proliferation and function. In addition to summarizing published results, we discuss animal models and assays effective in assessing therapeutic efficacy. This analysis underscores the therapeutic potential of current lab-made hepatocytes, but also highlights deficiencies and uncertainties that need to be addressed in future studies aimed at developing liver cell therapies with lab-made hepatocytes. (Hepatology 2016;64:287-294).

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